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ABSTRACT:
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terminal and a connection process with such as a flexible printed circuit board
can be eliminated.

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(54) COMPACT MOTOR

(57)Abstract:
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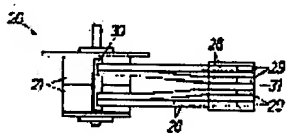

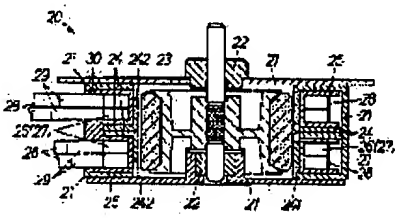

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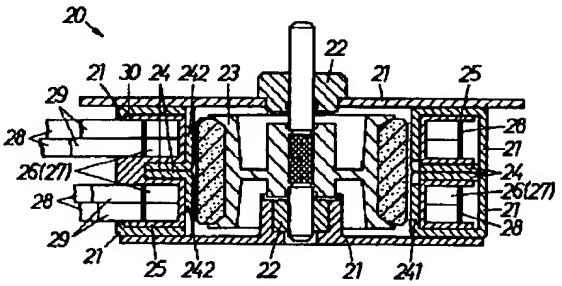
(54)【発明の名称】　小型モータ

(57)【要約】
【目的】　小型モータにおいて従来必要な中継用端子をなくして、接続部分を単純化し、また端子に対する接続工程を省略できるようにすることである。
【構成】　コイルボビンにリボン状の導体を巻き付けてコイルを形成し、このコイルの少なくとも最外層の一部を含めてコイル端に合成樹脂フィルムなどの可撓性の補強板を貼り付け、このコイル端を所定間隔で端子板に固定して、この端子板の部分で端子を構成する。



２０：小型モータ　２７：端体
２１：ケーシング　２８：補強板
２３：永久磁石回転子　２９：コイル端
２４：コア　３０：開口部
２５：コイルボビン　３１：端子板
２６：コイル　３２：端子

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【特許請求の範囲】

【請求項1】　永久磁石回転子と、コアと、このコアの極歯を囲むコイルボビンとを有する小型モータにおいて、上記コイルボビンにリボン状の導体を巻き付けてコイルを形成し、少なくとも巻き付け最外層の一部を含めてコイル端に合成樹脂フィルム等の可撓性の補強板を貼り、コイル端を所定間隔で端子板に固定して端子としたことを特徴とする小型モータ。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、小型モータのコイルにつながる端子部分の改良に関する。

【０００２】

【従来の技術】図１ないし図３は、従来の小型モータ１０の構成を示している。小型モータ１０は、磁性材のケーシング１１の内部で、軸受け１２によって回転自在に支持された永久磁石回転子１３、ケーシング１１と一体または別体に形成された２つの環状のコア１４、これらのコア１４の極歯１４１、１４２を囲むコイルボビン１５に巻き付けられた励磁用のコイル１６によって構成されている。

【０００３】そして、コイル１６の端部は、例えばコイルボビン１５に固定されたピン状中継用の端子１７にからげた状態で半田付けなどによって固定され、さらにコイルボビン１５の端子台１５１の部分に取り付けられたフレキシブルプリント基板１８の導電パターン１８１に接続され、先端部分の端子板１９によって補強され、この部分で駆動回路のコネクタなどに接続できるようになっている。

【０００４】上記従来のものでは、コイルボビン１５に取り付けられる端子１７が不可欠であり、部品数が多くなるほか、この端子１７に対するコイル１６の端部の接続やフレキシブルプリント基板１８の接続工程が必要となり、製作工数が多くなるという欠点がある。

【０００５】

【発明の目的】したがって、本発明の目的は、この種の小型モータにおいて従来必要な端子をなくすることによって、接続部分を単純化し、また端子に対する接続工程を省略できるようにすることである。

【０００６】

【発明の解決手段】上記目的のもとに、本発明は、コイルボビンにリボン状の導体を巻き付けてコイルを形成し、このコイルの少なくとも最外層の一部を含めてコイル端に合成樹脂フィルムなどの可撓性の補強板を貼り付け、このコイル端を所定間隔で端子板に固定して、この端子板の部分でコイル端を直接外部のコネクタなどに接続できるようにしている。

【０００７】

【実施例】図４ないし図７は、本発明の小型モータ２０の構成を示している。この小型モータ２０は、従来のも

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のと同様に、磁性材のケーシング２１の内部で、上下の軸受け２２によって回転自在に支持された永久磁石回転子２３と、ケーシング２１によりまたはこれと別体に形成されたコア２４と、このコア２４の極歯２４１、２４２を囲む非磁性材のコイルボビン２５に巻き付けられたコイル２６とを有している。

【０００８】コイル２６は、リボン状すなわち断面方形状の導体２７をコイルボビン２５に隙間のない状態で巻き付けて、巻き付き密度の高い状態で形成されており、断線防止のために、巻き付け状態の少なくとも最外層の導体２７の一部を含めて、合成樹脂フィルムなどの可撓性の補強板２８を貼り付けることによって補強され、コイル端２９を形成している。これらのコイル端２９は、ケーシング２１に形成された開口部３０から外部に導き出され、薄い絶縁体の端子板３１に所定の間隔のもとに導体２７のある側面で固定されて、端子３２を形成している。

【０００９】このように、コイル２６を形成する導体２７の端部つまりコイル端２９は、一例として、導体２７と同じ幅のフィルムなどの補強板２８によって機械的に補強され、かつケーシング２１の開口部３０から外部に導き出されて、絶縁体の端子板３１によって補強されているため、駆動回路のコネクタなどのピッチに合わせた状態で、駆動回路のコネクタなどに直接差し込んで接続できる構成となっている。なお、最外層の補強板２８が絶縁体であって、コイル２６を被覆しているため、コイル２６の外側部分を保護するための絶縁性テープなどが不要となる。

【００１０】

【発明の効果】本発明では、リボン状の導体がコイルボビンに対して空間のない状態で高い密度で巻き付けられ、その少なくとも最外層の部分で可撓性フィルムなどの補強板によって補強され、外部に導かれて、端子板と一体となって端子が形成されるためコイルボビンの部分に埋設される中継用の端子が不要となり、端子部分の構造が簡略化でき、また端子に対するコイルの接続やフレキシブルプリント基板などの接続工程が省略できる。また、導体が可撓性の補強板によって補強されているため、導体の断線が防止でき、しかも導体が補強板によって補強され、かつ端子板と一体となって端子を形成していて、端子の部分で駆動回路のコネクタなどに差し込みによって直接接続できるため、導体と駆動回路との接続部分の構造が簡略化でき、また接続操作も簡単になる。

【図面の簡単な説明】

【図１】従来の小型モータの平面図である。

【図２】従来の小型モータの背面図である。

【図３】従来の小型モータの要部の拡大断面図である。

【図４】本発明の小型モータの平面図である。

【図５】本発明の小型モータの背面図である。

【図６】本発明の小型モータの要部の拡大断面図であ

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る。

【図7】端子部分の拡大側面図である。

【符号の説明】

20　小型モータ
21　ケーシング
23　永久磁石回転子
24　コア
25　コイルボビン

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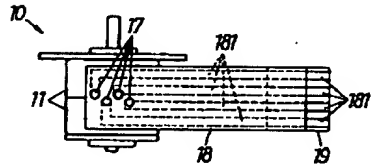
26　コイル
27　導体
28　補強板
29　コイル端
30　開口部
31　端子板
32　端子

【図1】



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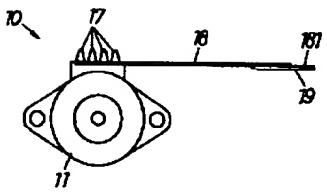

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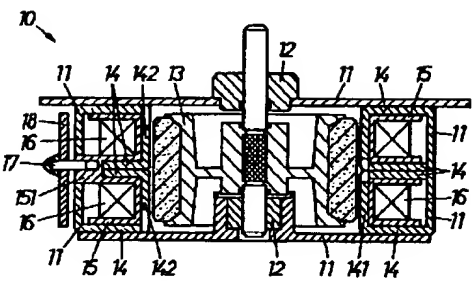

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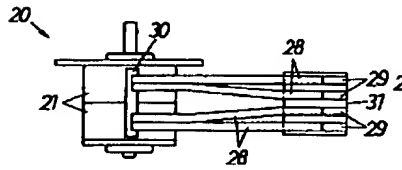

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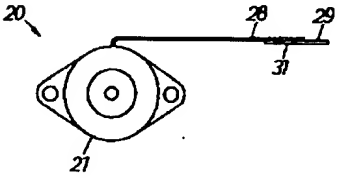
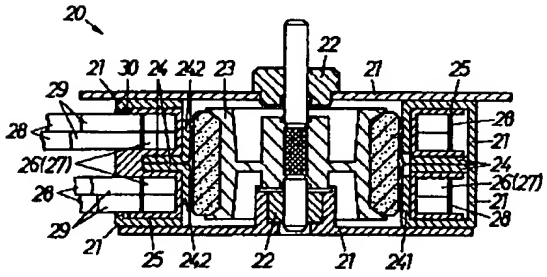


【図7】

28：補強板　　31：端子板
29：コイル端　　32：端子

【図6】



20：小型モータ　　27：導体
21：ケーシング　　28：補強板
23：永久磁石回転子　　29：コイル端
24：コア　　30：開口部
25：コイルボビン　　31：端子板
26：コイル　　32：端子

DETAILED DESCRIPTION

[Detailed description]
[0001]
[Field of the Invention] this invention relates to the enhancement for the terminal area connected with the coil of a small motor.
[0002]
[Prior art] Drawing 1 or drawing 3 shows the configuration of the conventional small motor 10. The small motor 10 is the interior of the casing 11 of magnetic material, and is constituted by the coil 16 for excitation twisted around the coil bobbin 15 surrounding **** 141 and 142 of two annular cores 14 formed in the permanent magnet rotator 13 and the casing 11 which were supported by the bearing 12 free [rotation], one, or another field, and these cores 14.
[0003] And soldering etc. is fixed in the status that it tucked up for the terminal 17 for a pin-like relay fixed to the coil bobbin 15, and it connects with the electric conduction pattern 181 of a flexible printed circuit board 18 further attached in the fraction of the terminal block 151 of the coil bobbin 15, and the edge of a coil 16 is reinforced by the terminal assembly 19 for a point, and can be connected now to the connector of a drive circuit etc. in this fraction.
[0004] In the above-mentioned conventional thing, the terminal 17 attached in the coil bobbin 15 is indispensable, the number of parts increases, and also the connection process of connection of the edge of a coil 16 or the flexible printed circuit board 18 over this terminal 17 is needed, and there is a fault that a manufacture man day increases.
[0005]
[The purpose of invention] Therefore, the purpose of this invention is simplifying a part for a connection and enabling it to omit the connection process over a terminal by losing a conventionally required terminal in this kind of small motor.
[0006]
[The resolution means of invention] the basis of the above-mentioned purpose -- this invention -- a coil bobbin -- a ribbon-like conductor -- twisting -- a coil -- forming -- this coil -- flexible back up plates, such as a synthetic-resin film, are stuck on an end winding at least including a part of outermost layer, this end winding is fixed to a terminal assembly at intervals of predetermined, and it enables it to connect an end winding to an external connector etc. directly in the fraction of this terminal assembly
[0007]
[Example] Drawing 4 or drawing 7 shows the configuration of the small motor 20 of this invention. the permanent magnet rotator 23 which this small motor 20 is the interior of the casing 21 of magnetic material like the conventional thing, and was supported by the up-and-down bearing 22 free [rotation], and the casing 21 -- or it has the core 24 formed in this and another field, and the coil 26 twisted around the coil bobbin 25 of the nonmagnetic material surrounding **** 241 and 242 of this core 24
[0008] A coil 26 twists the ribbon-like, shape of i.e., cross-section rectangle, conductor 27 in the status that there is no opening in the coil bobbin 25, is formed in the status that a coiling-round density is high, is twisted for open-circuit prevention, at least, including a part of conductor 27 of the outermost layer, is reinforced by [of the status] sticking the flexible back up plates 28, such as a synthetic-resin film, and forms the end winding 29. It is drawn from the opening 30 formed in casing 21 outside, it is fixed on the side face which has a conductor 27 in the terminal assembly 31 of a thin insulator at the basis of a predetermined spacing, and these end windings 29 form the terminal 32.
[0009] Thus, since it is mechanically reinforced by the back up plates 28, such as a film of the same width of face as a conductor 27, the edge 29, i.e., the end winding, of a conductor 27 which forms a coil 26, and it is drawn from the opening 30 of casing 21 outside and is reinforced by the terminal assembly 31 of an insulator as an example, it is in the status doubled with pitches, such as a connector of a drive circuit, and serves as the configuration which inserts in the connector of a drive circuit etc. In addition, the back up plate 28 of the outermost layer is an insulator, and since the coil 26 is covered, the insulating tape for protecting the lateral part of a coil 26 etc. becomes unnecessary.
[0010]
[Effect of the invention] By this invention, a ribbon-like conductor is twisted by the high density by the status that there is no space to a coil bobbin. It is reinforced with the fraction of the outermost layer by back up plates, such as a flexible film, at least. the -- It can be led outside, since a terminal is formed united with a terminal assembly, the terminal for a relay laid under the fraction of a coil bobbin can become unnecessary, the structure for a terminal area can be simplified, and the connection processes over a terminal, such as connection of a coil and a flexible printed circuit board, can be omitted. Moreover, since an

open circuit of a conductor can be prevented, a conductor is moreover reinforced by the back up plate, since the conductor is reinforced by the flexible back up plate, and the terminal is formed united with a terminal assembly and a direct file can be carried out to the connector of a drive circuit etc. with a plug in the fraction of a terminal, the structure for a connection of a conductor and a drive circuit can be simplified, and connection operation also becomes easy.

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EFFECT OF THE INVENTION

[Effect of the invention] By this invention, a ribbon-like conductor is twisted by the high density by the status that there is no space to a coil bobbin. It is reinforced with the fraction of the outermost layer by back up plates, such as a flexible film, at least. the -- It can be led outside, since a terminal is formed united with a terminal assembly, the terminal for a relay laid under the fraction of a coil bobbin can become unnecessary, the structure for a terminal area can be simplified, and the connection processes over a terminal, such as connection of a coil and a flexible printed circuit board, can be omitted. Moreover, since an open circuit of a conductor can be prevented, a conductor is moreover reinforced by the back up plate, since the conductor is reinforced by the flexible back up plate, and the terminal is formed united with a terminal assembly and a direct file can be carried out to the connector of a drive circuit etc. with a plug in the fraction of a terminal, the structure for a connection of a conductor and a drive circuit can be simplified, and connection operation also becomes easy.

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MEANS

[The resolution means of invention] the basis of the above-mentioned purpose -- this invention -- a coil bobbin -- a ribbon-like conductor -- twisting -- a coil -- forming -- this coil -- flexible back up plates, such as a synthetic-resin film, are stuck on an end winding at least including a part of outermost layer, this end winding is fixed to a terminal assembly at intervals of predetermined, and it enables it to connect an end winding to an external connector etc. directly in the fraction of this terminal assembly

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[Translation done.]